

**METHOD AND APPARATUS FOR COMMERCE ITEM
INFORMATION HOMOGENIZATION IN ELECTRONIC COMMERCE
SYSTEM**

BACKGROUND OF THE INVENTION

The invention relates to a method and apparatus for homogenizing information related to goods or services sold through an online merchant system. The invention further relates to a method of tracking and reporting commerce metrics in an electronic commerce shopping and merchandising system.

DESCRIPTION OF THE RELATED ART

The World Wide Web ("Web") is part of a global computer network known as the Internet through which Online Service Providers ("OSPs") 1, such as Microsoft Network, CompuServe, Prodigy and America Online, enable on-line users ("Users") of OSPs 1 to link to the Web. See FIG. 1. As a result Users may access the Web sites of a variety of online entities to retrieve a variety of content as well as purchase a variety of products and services from distinct online

entities. Users may directly access the online merchant systems of distinct vendors **3** on the Web and also the online merchant systems of eCommerce Aggregators **4**. Online eCommerce aggregators **4** access, search and retrieve product information from various vendor databases to provide a comparison shopping mechanism for Users of the aggregator's **4** Web site.

A Web based online merchant system enables an online entity, such as a vendor **3** or aggregator **4**, to particularize the Web site pages that display and describe its product or services, *i.e.* "commerce items", to Users. The online entity determines the layout and display of Web site pages having descriptive content including text, images, sound and video. The general manner of creating Web site content using HyperText Markup Language (HTML) and delivering it to Web browsers is well known in the art. Users may access an online entity's merchant Web site using a Web browser, *e.g.* Netscape Navigator, installed on a client connected to the Web through an OSP **1**. The User's Web browser loads and interprets the HTML to format and display the online entity's Web page for the User's Web browser. An online merchant system may also provide a User interface, *e.g.* GUI, to enable shoppers to navigate a online entity's site and

identify commerce items of interest, obtain specific information regarding commerce items, and to electronically purchase commerce items.

For the purpose of this application, a vendor **3** is considered to be any online entity that engages in commercial transactions involving commerce items.

Vendors **3** typically store information , *i.e.* "commerce item information **33**", related to its commerce items such as product descriptions, specifications, prices and images, in relational databases. Relational databases are well known in the art and generally comprise a logical design structure , *i.e.* a schema, that defines the groupings, *e.g.* tables, of data, the distinguishing characteristics, *e.g.* attributes, of that data, and the relationships between different groupings of data in a vendor database **31**. Once the vendor's database schema is designed, the vendor **3** may use a database management system, also well known in the art, to build and administer its database. Thus, vendors **3** typically create an internal proprietary schema to organize and manage their databases **31**.

Most commercially available online merchant systems require that vendors **3** organize vendor commerce item information **33** in databases **31** according to a predefined schema. Thus, because various vendors **3** organize their item

information **33** according to proprietary database schemas, to use these systems a vendor **3** must either convert its existing database **31** to a different and predefined schema, or the vendor **3** must create a new database **31** having the predefined schema. Either option requires substantial efforts and costs which
5 may indirectly force vendors **3** to compromise their database design and management. It follows that Users are less likely to have a successful shopping experience while visiting the vendor's merchant Web site. Other vendors **3** may simply forego making their databases **31** available to Users because of the cost of implementing a high quality merchant Web site.

One potential solution is to standardize the format of communicated commerce item information **33** between online entities. Alternatively, a single online entity could provide and manage an aggregate database **32** that combines the commerce item information **33** from several distinct vendors **3**. However, since
15 each vendor **3** has likely developed an internal proprietary database schema, it is likely that the commerce item information **33** from the distinct vendors **3** would have differing formats that will make the aggregate database **32** difficult to successfully build, manage, and search. Thus, it would be desirable to enable distinct vendors **3** to facilitate commercial transactions of their commerce items

through an aggregate database **32** by homogenizing the format of commerce
item information **33** from distinct vendors **3**.

A potential drawback to the above proposed solution is loss of control over
commerce metrics that measure the commercial activity related to a commerce
item for sale through an online merchant system. Thus, it would also be
desirable to provide a means of enabling a vendor **3** to retrieve commerce
metrics related to the commerce items sold from an aggregate database **32** and
an online merchant system.

SUMMARY OF THE INVENTION

A typical system implementing the invention includes both hardware and software
systems within an online merchant system. Included in the hardware and
software system are those components necessary to provide internet access
between OSPs **1** and distinct vendors **3** of commerce items. Such Internet
infrastructure hardware and software systems are readily available and their
operation and design are obvious to those of ordinary skill in those arts.

Referring to FIG. 3, the invention enables OSPs 1 to improve a User's online shopping experience by improving the efficiency of a User's online shopping queries. One aspect of the invention comprises a homogenizing function 60 under control of the OSP 1 that standardizes the format of commerce item information 33 contained within data feeds 36 received from the distinct vendors 3. The homogenizing function 60 further stores the homogenized commerce item information 33 to an aggregate database 32. The homogenizing function 60 generally comprises a homogenizing system 62, *i.e.* hardware under control of software, under management by the OSP 1 to receive and store the commerce item information 33 from distinct vendors 3 into the schema of the aggregate database 32 using a common format.

Another aspect of the invention associates a commerce item information tag 52 with the commerce item information 33 entered into the aggregate database 32.

The commerce item information tag 52 facilitates the gathering and reporting of commerce metrics related to the commercial activity of commerce item for sale through the online merchant system. Commerce metrics are considered to include or relate to the temporal, quantitative, or qualitative information regarding advertisement(s) of, and regarding database shopping "hits" retrieving commerce

item information **33** from the aggregate database **32**. A further aspect of the invention comprises the local generation of such commerce item information tags **52** and the use of an advertising server **69** with the tags **52** for reporting and recording such database hits.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 depicts a block diagram of the Web illustrating the context within which an embodiment of the present invention is practicable, the OSP **1** is accessible by the distinct vendors **3** via a backbone network, *e.g.* Internet;

FIG. 2 depicts an embodiment of a methodology for generating product identifiers **50** including commerce item information tags **52**;

FIG. 3 depicts a simplified block diagram of an embodiment of the invention; and

FIG. 4 depicts a flow diagram of the homogenizing process according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the invention are useful, for example, in an online merchant system. Referring to FIG. 3, a homogenizing function **60** standardizes

the format of commerce item information **33** received from distinct vendors **3** into the online merchant system and further associates a commerce item information tag **52** with the received commerce item information **33** to enable the capture of metrics , *i.e.* "commerce metrics", related to the commercial activity of commerce items that are advertised and are for sale through the online merchant system.

In a first preferred embodiment, the homogenizing function **60** comprises a hardware and software homogenizing system **62**. The homogenizing system **62** standardizes the commerce item information **33** contained within the commerce item information data feeds **36** originating from the online merchant systems of a plurality of distinct online vendors **3**. The system **62** further initiates the storage of the commerce item information **33** in the aggregate database **32**. In a second embodiment (not shown), the homogenizing function **60** communicates and/or provides to vendors a preferred standardized format for data feeds **36** delivered from such distinct online entities. In either embodiment, the homogenizing function **60** further initiates the association of commerce item information tags **52** with the commerce item information **33**, both stored to the aggregate database **32**.

In the first embodiment, commerce item information **33** contained within data feeds **36**, which originate from distinct online entities are routed to the homogenizing system **62** in a manner ordinary in the art for internet infrastructure systems. Thus, the homogenizing system **62** includes a communication function/application implementing an Internet Protocol stack. The system **62** may access the File Transfer Protocol (FTP) server located on each of the distinct vendors' merchant systems, or alternatively, the online entities may interface with the FTP server of the system **62** to initiate delivery of the data feeds **36**.

Each data feed **36** comprises a number of commerce item information elements **38** that are later combined by the homogenizing system **62** into distinct information packets **37**. Each commerce item information packet **37** relates to a commerce item for sale from the online vendor **3** and comprise such commerce item information elements **38** that collectively relate to the commerce item for sale.

It should be noted that examples of data feed and/or commerce item formats are Product Markup Language (PML) and XML.

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In the preferred embodiment of the invention, because the formats of delivered commerce item information from the distinct vendors are contemplated to vary to some degree, the homogenizing system **62** comprises a parsing function **66** that detects a packet delimiter indicating breakpoints between commerce item information packets **37**. Packet delimiter detection may comprise either the use of a standard packet delimiter or communication between the vendor **3** and OSP **1** as to the nature of the packet delimiter.

The homogenizing system **62** also comprises a mapping function/application **67** that writes the commerce item information to the aggregate database **32** according to the schema of the aggregate database **32**.

A preferred data homogenizing processes comprises two logical processes, and is described with reference to FIGS. 3 and 4. The first process is a matching process **51** that separates information packets **37** by primary categories and then applies a similarity search on the packets **37**. The similarity search involves comparing specific commerce item information from each commerce item to those within a database of known commerce items by using a set of weights and filters related to the commerce item category. A result of the matching process is

each commerce item information packet **37** is augmented with resultant matching results.

The second process is a validation process **52** whereby each commerce item packet **37** is read and/or the associated database record representing the commerce item is read, and such associated database record of the aggregate database **32** is inserted, updated, or deleted.

One preferred aggregate database **32** schema comprises a hierarchical structure of categories of commerce items grouped according to consumer shopping expectations. In other words, the database schema associates related or competitive commerce items within the aggregate database **32** such that a User's shopping query of the aggregate database **32** will return commerce item information **33** from distinct vendors **3** for competitive commerce items. FIG. 2 depicts an example of a hierarchical structure of entities representing commerce items.

The preferred homogenizing function **60** also generates and associates product identifiers ("PIDs") **50** with the commerce item information **33** stored in the

aggregate database **32** according to a methodology that reflects both similarities and differences in commerce items. Thus, in an example methodology depicted in FIG. 2, PIDs **50** for two different commerce items, *e.g.* Models of dirt bikes from the same Maker, may have similar vendor item information **33**, and hence similar PIDs **50** comprised of like components, *e.g.* $_{-n} + _{-n} + _{-n} + _{-n}$, but also include a distinguishing PID **50** component *e.g.* $_{-0}$ or $_{-1}$. Further, it is preferable that at least a portion of the PID **50** is designated as a commerce item information tag **52**. That is, it should be appreciated that $_{-}$ is a concatenation of corresponding items above it as shown in Fig. 2. Finally, while not preferred, it is contemplated that portions of a particular PID **50**, or the commerce item information tag **52**, be generated by separate business entities - such as by vendors **3**, aggregators **4**, and OSPs **1** - and combined to form the resultant PID **50**.

PID **50** and commerce item information tag **52** generation according to the preferred embodiment is preferably automatic and software controlled. In one embodiment, a sorting or filtering algorithm is implemented that parses vendor item information **33** from the vendor's data feed **36**, sorts that item information **33**, and assign PIDs **50** and commerce item information tags **52** to each unit of

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vendor item information **33** stored into the aggregate database **32**. The preferred algorithm to generate PIDs **50** comprises a sorting or filtering function to detect similarities and differences between vendor item information **33** describing commerce items, a PID **50** generating function, and a PID **50** assignment function that associates the generated PIDs **50** and the respective vendor item information **33** within a database. Parsing and sorting algorithms are ordinary in the art and a person with ordinary skill in the art would be able to create a parsing and sorting algorithm according to the requirements disclosed herein.

10 The commerce item information tag **52** included together with the commerce item information **33** in the aggregate database **32** preferably comprises a unique sequence of elements, *e.g.* alpha numeric or binary sequence, that enables the capture and reporting of commerce metrics on the particular commerce item associated with the commerce item information tag **52**. Thus, the commerce item information tag **52** enables the recordation and reporting of commercial activity related to a commerce item. In the preferred embodiment, a reporting server **65** implemented either in software on the Web server or in a separate hardware/software system (see FIG. 3), detects and records aggregate database **32** queries retrieving commerce item information tags **52** thereby capturing

commerce metrics reflecting the commercial activity of a commerce item.

Moreover, because commerce item information tags **52** are traceable to the commerce item information **33** and the online entity originating the commerce item information **33**, detailed reports regarding particular commerce items may be

5 generated. Each occurrence of a commerce metric of a particular commerce item, as indicated by a retrieval of associated commerce item information **33** from the aggregate database **32**, initiates a recordation and reporting of the associated commerce item information tag **52** by the reporting server **65**.

10 Commerce metrics may be measured and recorded by the commerce item information tag **52** by software methods and/or functions that include; incremented counters, time-date stamping, and recordation of User Web navigation history. Moreover, commerce item information **33** and tags **52** may be retrieved from the aggregate database **32** by a User initiated event or a software
15 initiated event. Thus, a User's shopping queries retrieving commerce item information **33** and tags **52** generates commerce metrics that can be captured by the reporting server **65**.

The reporting server **65** may thereafter be queried by the vendor **3** and/or the
OSP **1** to generate reports regarding commerce metrics.

Additionally, an advertising application/server **69** may also generate and record
commerce metrics of commerce item information elements, *e.g.* specs, price,
images, may include advertising elements. Thus, commerce metrics are also
generated as the advertising application/server **69** pulls commerce item
information **33** and tags **52**.

It should be noted that in the preferred embodiment, a second tag that is invisible
to the User is created when results from the User's query to the database **32** is
displayed to the User's browser. This second tag contains an embedded request
to the advertising server **69**. That is, as each displayed item in a query result is
displayed on the User's browser, the second tag performs a unique request to the
advertising server **69** using the commerce item information **52**. The unique
request to the advertising server also includes the query term that caused the
query result to be displayed. Hence, the advertising server **69** reports the
advertising request for each of the items, thus creating a record of each item
displayed as a result of a query term. Rather than return an advertising image,

the advertising server returns a small 1-by-1 pixel image that is invisible to the User.

It should be noted that several commerce metrics reports are enabled by the invention. Preferred recorded and reported commerce metrics related to commerce items include specific and general information regarding, but not limited to user shopping queries of the aggregate database 32 and tracking of commerce item advertisements on the online merchant system.

Although the invention has been described in detail with reference to particular preferred embodiments, persons possessing ordinary skill in the art to which this invention pertains will appreciate that various modifications and enhancements may be made without departing from the spirit and scope of the claims that follow.